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PATENT & TRADEMARK OFFICE

	Attorney Docket No.	95-536
	Application Number	10/700,474
REPLY/AMENDMENT FEE TRANSMITTAL	Filing Date	November 5, 2003
	First Named Inventor	HWANG
	Group Art Unit	2611
AMOUNT ENCLOSED $ 0	Examiner Name	TORRES, Juan A.

FEE CALCULATION (fees effective 10/01/2003)

CLAIMS AS AMENDED	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra		Rate	Calculations
TOTAL CLAIMS	12	20	0 (3)	X	$50.00 =	$0
INDEPENDENT CLAIMS	2	2	0	X	$200.00 =	$0

Since an Official Action set an <u>original</u> due date of _____, petition is hereby made for an extension to cover the date this reply is filed for which the requisite fee is enclosed (1 month ($120); 2 months ($450); 3 months ($1020); 4 months ($1,590); 5 months ($2,160)):	$0
If Statutory Disclaimer under Rule 20(d) is enclosed, add fee ($110)	+$0
Total of above Calculations =	$0
Reduction by 50% for filing by small entity (37 CFR 1.9, 1.27 & 1.28)	-
TOTAL FEES DUE =	$0

(1) If entry (1) is less than entry (2), entry (3) is "0".
(2) If entry (2) is less than 20, change entry (2) to "20".
(4) If entry (4) is less than entry (5), entry (6) is "0".
(5) If entry (5) is less than 3, change entry (5) to "3".

METHOD OF PAYMENT

[ ]   Check enclosed as payment.

[ ]   Charge "TOTAL FEES DUE" to the Deposit Account No., below.

AUTHORIZATION

[X]   If the above-noted "AMOUNT ENCLOSED" is not correct, the Commissioner is hereby authorized to credit any overpayment or charge any additional fees under 37 CFR 1.16 or 1.17 necessary to maintain pendency of the present application to:

Deposit Account No.:	50-0687
OrderNo.: (Client/Matter)	95-536

SUBMITTED BY: MANELLI DENISON & SELTER PLLC

Typed Name	Leon R. Turkevich	Reg. No.	34,035
Signature		Date	September 13, 2007

Docket No.: 95-536

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: :

HWANG *et al.* :

Serial No.: 10/700,474 :   Group Art Unit: 2611

Filed: November 5, 2003 :   Examiner: TORRES, Juan A.

For: DC OFFSET CANCELLATION IN A DIRECT CONVERSION RECEIVER
CONFIGURED FOR RECEIVING AN OFDM SIGNAL

RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Nonfinal Official Action mailed June 15, 2007, Applicant submits the following remarks.

Reconsideration and allowance of the above-referenced application are respectfully requested. Claims 1-12 are pending in the application.

Applicant notes with appreciation that the prior objection to the specification has been withdrawn.

Claims 1-4, 6-9 and 11-12 stand rejected under 35 USC §102(e) as having been anticipated by US Patent Publication No. 2004/0203472 by Chien (using U.S. Patent Publication No. 2004/0002308 by Eberle at paragraphs 78 and 94-97 for "inherency of 802.11a short preambles for DC offset compensation (DCO)"). Claims 1, 6 and 11-12 also stand rejected

under 35 USC §102(e) as having been anticipated by US Patent Publication No. 2005/0058227 by Birkett (using U.S. Patent Publication No. 2004/0002308 by Eberle at paragraphs 78 and 94-97 for "inherency of 802.11a short preambles for DC offset compensation (DCO)"). These rejections are respectfully traversed, because these rejections failed to demonstrate that the applied references disclosed each and every claim limitation, expressly or inherently.

As demonstrated below, none of the applied references (Chien, Eberle, or Birkett et al.) disclose or suggest the claimed feature in independent claims 1 and 6 of "determining first and second DC offset components based on *filtering prescribed subcarrier components* from a prescribed preamble portion of each of the first and second components, respectively", as claimed. To the contrary, the applied references teach no more than determining DC offset cancellation based on performing averaging the received, unfiltered signal components.

Each of the independent claims 1 and 6 specify "recovering first and second components from the wireless signal by mixing the wireless signal with first and second carrier frequency signals, respectively." Claims 1 and 6 also specify "determining first and second DC offset components based on *filtering prescribed subcarrier components from a prescribed preamble portion of each of the first and second components, respectively*".

As illustrated in the specification with respect to Figures 3 and 4, the DC offset estimator 102 does not perform an accumulation of the *received I and Q signal samples*; to the contrary, the FIR filter 110 of Fig. 4 *filters* the prescribed twelve (12) subcarrier components from the I and Q digital signal samples in the short training symbols 118; "[h]ence, the FIR filter 110 outputs only 'i' and 'q' components *where the prescribed subcarrier components have been filtered from the short training symbols 118*." (Page 7, lines 7-9). Hence, the accumulator 126 of Figure 4 accumulates the *filtered samples* "i" and "q", and not the unfiltered I and Q signal samples. The accumulation of filtered samples is significant, because in contrast to prior art solutions that rely on an ideal distribution of received I or Q signal samples having a symmetric amplitude distribution *centered at zero*, the disclosed embodiment in the subject application describes that an ideal accumulation of *filtered* i and q samples should result in no offset value at all:

In theory, the *filtering of the prescribed 12 subcarrier components* as specified by the IEEE 802.11a Standard should result in *filtered components "i" and "q"* which, when summed together and averaged over a prescribed number of samples by the averaging circuit 112, should result in the DC offset components I_{DC} and Q_{DC} *having a value of zero*. However, the presence of an induced DC component in the I and Q components generated by the receiver 10 causes the DC offset components I_{DC} and Q_{DC} to have a nonzero component.

(Page 7, lines 17-22).

Hence, the explicit claim language in claims 1 and 6 and the specification require that the determination of first and second DC offset components is based on filtering the prescribed subcarrier components from the preamble portion. These and other features are neither disclosed nor suggested in the applied prior art.

Chien et al.

Chien et al. provides no disclosure or suggestion of determining first and second DC offset components based on filtering prescribed subcarrier components from a prescribed preamble portion of each of the first and second components, as claimed. To the contrary, Chien et al. simply describes at paragraph 132 that "a pre-processor 1918 is used to remove the DC offsets and/or to reduce noise." In fact, Chien et al. discloses in paragraph 132 implementing the pre-processor 1918 using bandpass filters, where "[e]ach filter accepts either the real (i.e. I-channel) or the imaginary part (i.e. Q-channel) **of the received complex signal**" (lines 16-18), and "each filters centers on one of the transmit tones" (lines 20-21). Hence, paragraph 132 explicitly discloses using the **unfiltered** I and Q signals.

Further, Chien et al. at paragraph 135 discloses in Figure 20E that the unfiltered I and Q signals are sent to "a feed-forward DC cancellation circuit [1918] that measures the DC offset using averaging filters 2002 and 2004 and uses the estimated DC offset to cancel out the DC offset in the incoming signal." However, there is no disclosure or suggestion of determining the DC offset components based on "*filtering* prescribed subcarrier components *from* a prescribed preamble portion", as claimed.

Chien et al, at paragraph 19 describes no more than I-Q imbalances generally, and does not describe DC offset estimation at all, let alone filtering of the prescribed subcarrier components, as claimed.

For this reason alone the §102 rejection should be withdrawn because Chien et al. fails to disclose each and every element of the independent claims 1 and 6, namely that the DC offset components are determined based on filtering prescribed subcarrier components from the first and second components recovered from the wireless signal: reliance upon Eberle for inherency is irrelevant in the rejection, because Eberle was relied upon for "inherency of 802.11 short preambles for DC offset compensation", and not for the claimed filtering prescribed subcarrier components, as claimed.[1]

Eberle

Eberle also fails to disclose or suggest the claimed determining first and second DC offset components based on filtering prescribed subcarrier components from the prescribed preamble portion of the first and second components recovered from the wireless signal. Hence, Eberle is unable to establish inherency for this claimed feature.

Although Eberle describes in paragraph 78 that the IEEE 802.11a short preambles can be used for DC offset compensation, Eberle discloses in Figure 9 that the received unfiltered signal samples "si" and "sq" are used for DC offset estimation (see paragraphs 107-110). Moreover, paragraph 93 of Eberle does not describe that DC offset is based on an ideal zero value, as described above with respect to the quote of page 7, lines 17-22 of the subject application; to the

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[1]See MPEP 2112 ("The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993)(reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); ... 'The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" (quoting In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999))). When the Examiner alleges that a certain result is inherent in the operation of a reference, it must appear that this is necessarily so without any doubt. Ex parte Ruskin, 95USPQ 96 (Pat. Ofc. Bd. App. 1951).

contrary, Eberle specifies that the estimator "will only use the zero-*mean*, symmetric *amplitude distribution* as a priori knowledge" (lines 12-13). Further, Eberle <u>explicitly specifies</u> in paragraph 96 that "[t]he estimators work on **ADC input samples** si_{m-k} and sq_{m-k} sampled e.g. at 20 MHz"(lines 2-3) to obtain the DC offset values $D_{m,\{i,q\}}$ in paragraphs 94-97. Paragraph 97 describes no more than adding white Gaussian noise to the DC offset value $D_{m,\{i,q\}}$, and neither discloses nor suggests using *filtered* samples to determine the DC offset components, as claimed.

Hence, Eberle discloses use of the <u>unfiltered</u> signal samples, and not *filtered* samples to determine the DC offset components, as claimed. Hence, Eberle fails to establish inherency of this claimed feature.

Birkett et al.

Birkett et al. also describes in paragraphs 33 and 34 with respect to Figure 4 that the <u>unfiltered</u> I and Q signal samples are supplied to the DC estimation modules 36, 38 to "estimate the required offsets which is applied to the incoming I and Q signals." (Para. 34, lines 12-13). Paragraph 5 provides no more than a summary of IEEE 802.11, with no description or suggestion of DC offset compensation at all.

Birkett et al. simply describes that DC offset should be removed, with no description or suggestion whatsoever as to the *manner* in which the DC offset should be removed.

For this reason alone the §102 rejection should be withdrawn because Birkett et al. fails to disclose each and every element of the independent claims 1 and 6, namely that the DC offset components are determined based on filtering prescribed subcarrier components from the first and second components recovered from the wireless signal: reliance upon Eberle for inherency is irrelevant in the rejection, because Eberle was relied upon for "inherency of 802.11 short preambles for DC offset compensation", and <u>not</u> for the claimed filtering prescribed subcarrier components, as claimed.

Hence, the §102 rejections of independent claims 1 and 6 are per se legally deficient because they fails to demonstrate that the respective applied references, expressly *or inherently*, disclose each and every claim limitation in the manner claimed in independent claims 1 and 6.[2]

The §102 rejection of claims 2 and 7 also is traversed. As described above, none of the applied references disclose or suggest filtering the prescribed carrier components, as claimed. Hence, the applied references fail to disclose or suggest the claimed digital FIR filter configured for "*filtering the prescribed subcarrier components* and outputting filtered samples". The statement that the "accumulator" or "accumulator and dump" are FIR filters is unfounded, and fails to address the claimed feature of *filtering the prescribed subcarrier components* and outputting filtered samples. Hence, the applied references do not disclose "averaging the *filtered samples* associated with the prescribed preamble portion." For these and other reasons the rejection of claims 2 and 7 should be withdrawn.

It is believed the remaining dependent claims are allowable in view of the foregoing.

In view of the above, it is believed this application is in condition for allowance, and such a Notice is respectfully solicited.

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[2] As specified in MPEP §2131: "'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference' *Verdegaal Bros. V. Union Oil Co. of California,* 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). ... 'The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." MPEP 2131 (Rev. 3, Aug. 2005, at p. 2100-76).

To the extent necessary, Applicant petitions for an extension of time under 37 C.F.R. 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including any missing or insufficient fees under 37 C.F.R. 1.17(a), to Deposit Account No. 50-0687, under Order No. 95-536, and please credit any excess fees to such deposit account.

Respectfully submitted,

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